

REMARKS

The claims have been amended to correct minor typographical errors.

In the above Office Action, the Examiner rejected claims 1, 2, 7-10 and 12 under 35 U.S.C. §103(a) for being obvious over U.S. Patent No. 4,513,597 to Kimoto et al., hereafter Kimoto. The withdrawal of all previous grounds of rejection as set forth in the Office Action of March 14, 2008 is appreciated. However, it is believed these claims are also patentable over Kimoto for the following reasons.

The methods of independent claims 1 and 8 relate to methods for fining a metal surface to form crystal grains having sizes less than $1\text{ }\mu\text{m}$ at its surface. In claim 1 this is accomplished by projecting or peening shots or projectiles at the surface while a power per unit of area of the surface is controlled at a predetermined value that is greater than 11 KJ/sec-mm^2 . In claim 8, this is accomplished by projecting or peening shots or projectiles at the surface while a power per unit of area of the surface is controlled at a predetermined value, where the unit of area is calculated by multiplying a contact surface of a projectile or a shot by a number of the shots or projectiles.

In contrast, Kimoto relates to apparatus for reducing the watt loss of a grain-oriented electromagnetic steel sheet by projecting particles onto substantially linear selected portions thereof to produce strain in spot-formed regions.

"Watt loss" means a form of energy loss that occurs in electrical transformers and other inductors. The loss is due to a variety of mechanisms related to a fluctuating magnetic field, such as eddy current and hysteresis. This is entirely different from the technical field of the present invention which relates to a method for fining the surface of a method product "to form crystal grains having sizes less than $1\text{ }\mu\text{m}$ at its surface."

There is no discussion whatsoever in the cited reference about this limitation in claims 1 and 8.

The Examiner argues that Kimoto discloses in column 3, lines 38-48 "a process for forming crystal grains having sizes of 1-5 μm ... at the surface of a metal product by means of projecting or peening shots or projectiles (5) to the surface." The reference may teach projecting steel shot on a metal surface, but the 1 to 5 μm range is the "thickness of an insulating film of a phosphate or an organic compound" on the metal surface. It has nothing to do with grain size of the metal surface. See also column 6, lines 23-26 regarding this "insulating film."

Moreover, there is no discussion in the reference regarding the limitation in claim 1 of the power per unit of area of the surface being "greater than 11 KJ/sec-mm²" or the limitation in claim 8 that the unit of area is "calculated by multiplying a contact surface of a projectile or a shot by a number of the shots or projectiles." Nothing is mentioned about either of these features of the claims in Kimoto.

Regarding the power value of claim 1, the Examiner refers to Example 1, but it is not seen where this teaches or even remotely suggests the claimed value of "greater than 11 KJ/sec-mm²". Numbers are mentioned, but the Examiner has not demonstrated how they result in this value.

Regarding the calculations of the unit of area of claims 8 and 9, the Examiner refers to column 6, line 49 to column 7, lines 50 of Kimoto. While the limitations of these two claims are repeated in the rejection, it is not seen where anything even remotely similar to these limitations is taught in this portion of the reference. No nexus

is made by the Examiner between this portion of the reference and the claimed limitations.

As required by MPEP § 2143.03, "all words in a claim must be considered in judging the patentability of that claim against the prior art" and it is apparent the Examiner has not done so since the cited portions of Kimoto do not mention anything about any of these limitations in the noted claims. Moreover, as noted in MPEP § 2143.02, to support a conclusion that a claim would have been obvious, "all the claimed elements" must have been known in the prior art; and the Examiner has not shown where the claimed elements exist in Kimoto.

Accordingly, it is submitted the Examiner has not clearly articulated the reasons why the inventions of claims 1, 8 and 9 would have been obvious as required by MPEP § 2142 and 2143.

Since claims 2 and 7 depend from claim 1 and claims 10 and 12 depend from claim 8 or 9, it is submitted they are patentable over Kimoto for the same reasons.

While the Examiner rejected claims 4 and 11 over Kimoto in view of Shirai, Shirai does not disclose what is missing in Kimoto as discussed above. Since these claims also depend from claims 1, 8 or 9, it is believed that they are patentable over this combination for the same reasons expressed above with respect to claims 1 and 8.

Withdrawal of the grounds of rejection as set forth in the Office Action and allowance of claims 1, 2, 4 and 7-12 is therefore requested.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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